

Appln. No. 09/312,073
Supplemental Amendment dated June 23, 2003
Reply to Office Action of January 22, 2003

LISTING OF CLAIMS:

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1. (Previously Amended) The ink cartridge of claim 57, wherein a second engaging recess is formed on an outer surface of said lid.
 2. (Cancelled).
 3. (Previously Amended) The ink cartridge of claim 57, further comprising a seal member affixed to an outer surface of said lid, a portion of said seal member being removable.
 4. (Previously Amended) The ink cartridge of claim 57, wherein said lid has a center line, and said engaging recess is disposed at a position which deviates from the center line of said lid.
 5. (Cancelled).
 6. (Previously Amended) The ink cartridge of claim 57, wherein the engaging recess engages with a rod projecting from a carriage of the printer onto which the ink cartridge is mounted.
 7. (Previously Amended) The ink cartridge of claim 57, wherein said engaging recess is covered by a removable seal.

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8. (Previously Amended) The ink cartridge of claim 57, wherein said cartridge holder includes a lever, said engaging recess engaging with a projection formed on a lever of a cartridge holder of the ink jet printer.

9. (Previously Amended) The ink cartridge of claim 57, wherein said engaging recess comprising a first section for receiving the projection of the lever and a second section for receiving the member of the printer, and said first section and said second section being formed continuously.

10. (Original) The ink cartridge of claim 6, wherein said inner surface of said ink supply port is entirely angled.

11. (Original) An ink cartridge for an ink jet printer, comprising:
a housing having at least one wall;
at least one ink chamber for containing ink in said housing;
an ink supply port formed in one wall of said housing at an end of said ink chamber, said ink supply port having an inner opening and an outer opening;
ink supply passages at least partly defining said ink supply port, each of said ink supply passage projecting inward said housing from a bottom wall of said housing, said ink supply passage communicating with a respective ink chamber at an inner end thereof, said ink supply passage comprising a recessed part formed at a top thereof and a projecting edge surrounding said recessed part, said ink supply passage further comprising at least one protrusion member formed on said recessed part isolated from said projecting edge and a filter disposed on said projecting edge and said protrusion member; and

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at least one porous member impregnated with ink, and fitted in each of said ink chambers and engaging with said ink supply port through said ink supply passage.

12. (Previously Amended) The ink cartridge of claim 11, wherein the height of said protrusion member is higher than that of said projecting edge when said filter is secured onto said projecting edge.

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13. (Previously Amended) The ink cartridge of claim 11, wherein said protrusion member comprises two or more elongated protrusions.

14. (Original) The ink cartridge of claim 11, wherein said elongated protrusions extend toward said ink supply port which opens in said recessed part.

15. (Previously Amended) An ink cartridge for an ink jet printer, comprising:
a housing having walls and an opening, said housing containing ink, a top wall of said housing being constituted by a lid covering said opening of said housing;

at least one ink chamber defined by said housing and said lid;

an ink supply port formed on one of the walls of said housing;

at least one recess forming a space in an outer surface of said lid when the ink cartridge is packed under a vacuum condition, the pressure within said space being lower than the atmospheric pressure when the ink cartridge is packed; and

a seal member adhered to the outer surface of said lid, wherein said recess is isolated from an interior of the ink cartridge and exposed to an exterior of the ink cartridge when the seal member is adhered to the outer surface of said lid.

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16. (Previously Amended) The ink cartridge of claim 15, wherein said recess is partially covered by said seal member adhered onto the outer surface of said lid.

17. (Original) The ink cartridge of claim 16, wherein a portion of said seal member is removable, and said recess is disposed under the removable portion of said seal member.

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18. (Original) The ink cartridge of claim 17, wherein said recess is disposed on a part of said lid which is spaced apart from said ink supply port.

19. (Original) The ink cartridge of claim 15, wherein the ink jet printer includes a carriage, the cartridge being mounted in the carriage and said recess is disposed on a part of said lid which is engageable with a member of the carriage when the ink cartridge is mounted on the carriage.

20. (Previously Amended) The ink cartridge of claim 19, wherein the ink jet printer further includes a mounting lever mounted on the carriage wherein the member of the carriage comprises a projection projecting from the mounting lever.

21. (Original) The ink cartridge of claim 16, wherein plural number of said recesses are formed in the outer surface of said lid.

22. (Original) The ink cartridge of claim 15, further comprising a fine, circuitous groove formed in one surface of said lid where said recess is formed.

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23. (Original) The ink cartridge of claim 15, further comprising an air communication hole formed in said lid for communicating the interior of the ink cartridge with the atmospheric air, said air communication hole being disposed in the vicinity of said recess.

24-35. (Cancelled).

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36. (Previously Amended) An ink cartridge for an ink jet printer, comprising:
a housing containing ink;
an ink supply port formed on a wall of said housing at an offset position; and
a plurality of engaging recesses formed in the wall of said housing adjacent to and apart from said ink supply port, each said engaging recess being engageable with an associated projecting member of the printer when the ink cartridge is mounted on the printer, wherein at least one of the engaging recesses and the projecting members of the printer aligns the ink supply port with an ink supply needle of the printer prior to the insertion of the ink needle into the ink supply port.

37. (Previously Amended) The ink cartridge of claim 36, wherein the height of the projecting member is greater than that of the ink supply needle of the ink jet printer.

38. (Previously Amended) The ink cartridge of claim 37, further comprising an abutment member which abuts against the projecting member of the ink jet printer when the ink cartridge is mounted improperly.

39. (Previously Amended) The ink cartridge of claim 38, wherein said abutment member includes a part of said wall of said housing where the engaging recess is not formed.

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40. (Cancelled)

41. (Previously Amended) The ink cartridge of claim 36, wherein said ink supply port protrudes from said wall of said housing.

42. (Previously Amended) The ink cartridge of claim 36, wherein the cartridge has an odd number of said engaging recesses.

43. (Previously Amended) The ink cartridge of claim 36, wherein said ink cartridge has an even number of engaging recesses.

44. (Previously Amended) The ink cartridge of claim 42, wherein the position of said engaging recess is asymmetrical with respect to a center transversal line of said ink supply port.

45. (Previously Amended) The ink cartridge of claim 42, wherein at least two of the engaging recesses are disposed along a line.

46. (Previously Amended) The ink cartridge of claim 43, wherein at least two of the engaging recesses are disposed along a line.

47. (Previously Amended) The ink cartridge of claim 36, wherein at least one said engaging recess is rectangular in cross section.

48. (Previously Amended) The ink cartridge of claim 57, wherein a recessed port is formed on an outer surface of said lid, and said recessed port communicates with said air communication port and is isolated from said engaging recess.

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49. (Previously Amended) The ink cartridge of claim 48, further comprising a porous member fitted in an ink chamber defined by said housing and said lid, said porous member being impregnated with ink and engaging with said ink supply port.

50. (Previously Amended) The ink cartridge of claim 57, wherein said film includes a seal member affixed to an outer surface of said lid, a portion of said seal member being removable.

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51. (Previously Amended) The ink cartridge of claim 57, wherein said lid has a center line, and said engaging recess is disposed on the center line of said lid.

52. (Previously Amended) The ink cartridge of claim 57, wherein said engaging recess has capacity sufficient to receive gas escaped from the ink cartridge when the ink cartridge is packed in a package under a degassed condition.

53. (Previously Amended) The ink cartridge of claim 57, wherein the engaging recess engages with said projecting member from a carriage of the printer onto which the ink cartridge is mounted.

54. (Previously Amended) The ink cartridge of claim 57, wherein said engaging recess is completely covered by said film.

55. (Previously Amended) The ink cartridge of claim 53, wherein said cartridge includes a lever, said projecting member includes a projection formed on said lever.

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56. (Previously Amended) The ink cartridge of claim 57, wherein said engaging recess comprising a first section for receiving the projecting member of the printer and a second section formed continuously with the first section.

57. (Previously Amended) An ink cartridge for an ink jet printer having a cartridge holder, comprising:

a housing having a wall and an opening,

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a lid covering said opening of said housing;

an ink supply port formed on said wall of said housing; and

at least one engaging recess formed on said lid, said engaging recess being engageable with a projecting member of the printer when the ink cartridge is correctly mounted on the printer and said engaging recess being at least partially covered by a film which can be removed from the ink cartridge to create an air communication port to the atmosphere.

58. (Previously Amended) An ink jet printer, comprising:

a carriage;

a print head including a plurality of nozzles through which ink is ejected mounted on said carriage;

an ink cartridge, said ink cartridge being mounted on the carriage and, said ink cartridge comprising:

a housing having walls and an opening, a top wall of said housing being constituted by a lid covering said opening of said housing;

at least one ink chamber defined by said housing and said lid;

an ink supply port formed on one of the walls of said housing;

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at least one recess forming a space in an outer surface of said lid, the pressure within said space being lower than the atmospheric pressure when the ink cartridge is packed;
a seal member adhered to the outer surface of said lid,
wherein the recess is isolated from an interior of the ink cartridge and exposed to an exterior of the ink cartridge when the seal member is adhered to the outer surface of said lid.

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59. (Previously Amended) The printer of claim 58, wherein said recess is partially covered by said seal member adhered onto the outer surface of said lid.

60. (Previously Amended) The printer of claim 58, further comprising a mounting lever mounted on the carriage wherein a projection projecting from the mounting lever is engageable with said recess.

61. (Previously Amended) The printer of claim 59, wherein plural number of said recesses are formed in the outer surface of said lid.

62. (Previously Amended) An ink jet printer, comprising:
a carriage, said carriage having a plurality of projecting members and an ink supply needle extending therefrom;
a print head including a plurality of nozzles through which ink is ejected mounted on said carriage;
an ink cartridge, said ink cartridge being mounted on the carriage and, said ink cartridge comprising:

a housing having at least one wall;

an ink supply port formed on the wall of said housing at an offset position; and

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a plurality of engaging recesses formed in the wall of said housing adjacent to said ink supply port, said engaging recesses being engageable with the projecting members of the printer when the ink cartridge is mounted on the carriage wherein at least one of the engaging recesses and the projecting members of the printer aligns the ink supply port with the ink supply needle prior to insertion of the ink needle into the ink supply port.

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63. (Previously Amended) The printer of claim 62, wherein the height of the projecting member is greater than that of the ink supply needle of the ink jet printer.

64. (Previously Amended) The printer of claim 63, further comprising an abutment member which abuts against the projecting member of the ink jet printer when the ink cartridge is mounted in the improperly.

65. (Previously Amended) The printer of claim 64, wherein said abutment member includes a part of said wall of said housing where said engaging recess is not formed.

66. (Cancelled)

67. (Previously Amended) The printer of claim 62, wherein said ink supply port protrudes from said wall of said housing.

68. (Previously Amended) The printer of claim 62, wherein the ink cartridge has an odd number of said engaging recesses.

69. (Previously Amended) The ink jet printer of claim 62, wherein said ink cartridge has an even number of said engaging recesses.

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70. (Previously Amended) The ink jet printer of claim 68, wherein the position of said engaging recess is asymmetrical with respect to a center transversal line of said ink supply port.

71. (Previously Amended) The ink jet printer of claim 68, wherein at least two of the engaging recesses are disposed along a line.

72. (Previously Amended) The printer of claim 69, wherein at least two of the engaging recesses are disposed along a line.

73. (Previously Amended) The printer of claim 62, wherein at least one said engaging recess is rectangular in cross section.

74-82. (Cancelled)

83. (Previously Amended) The ink cartridge of claim 42, wherein the engaging recesses disposed along a same line are separate recesses.

84. (Previously Amended) The ink cartridge of claim 43, wherein the engaging recesses along the same line are formed by separate recesses.

85. (Previously Amended) The ink jet printer of claim 68, wherein the engaging recesses disposed along a same line are separate recesses.

86. (Previously Added) The ink cartridge of claim 69, wherein the engaging recesses along the same line are formed by separate recesses.

87. (Previously Amended) An ink jet printer, comprising:

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a carriage, said carriage having a projecting member extending therefrom;
a print head including a plurality of nozzles through which ink is ejected
mounted on said carriage;
an ink cartridge, said ink cartridge being mounted on the carriage and, said ink
cartridge comprising:
a housing having a wall and an opening,
a lid covering said opening of said housing;
an ink supply port formed on said wall of said housing; and
at least one engaging recess formed on said lid, said engaging recess being
engageable with a projecting member of the printer when the ink cartridge is correctly mounted
on the printer and said engaging recess being at least partially covered by a film which can be
removed from the ink cartridge to create an air communication port to the atmosphere.

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88. (Previously Amended) The ink jet printer of claim 87, wherein said engaging
recess is engageable after said film is removed.

89. (Previously Amended) The ink jet printer of claim 87, further comprising a
mounting lever mounted on the carriage wherein the member of the carriage comprises a
projection projecting from the mounting lever.

90. (Previously Amended) The ink jet printer of claim 88, wherein plural
number of said recesses are formed in the outer surface of said lid.

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91. (Previously Added) An ink cartridge for an ink jet printer, comprising:

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a housing having an opening, said housing containing ink therein; a lid covering said opening of said housing;

an ink supply port formed on a wall of said housing;

an engaging recess formed in the wall of said housing adjacent to said ink supply port, said engaging recess being engageable with a projecting member of the printer when the ink cartridge is correctly mounted on the printer, wherein:

said engaging recess is engageable with a lifter formed on a lever of a cartridge holder of the ink jet printer, and

said engaging recess comprising a first section for receiving the lifter of the lever and a second section for receiving the projecting member of the printer, and said first section and second section being formed continuously.

92. (Previously Added) An ink jet printer, comprising:

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a carriage having a plurality of projecting members and an ink supply needle extending therefrom;

a print head mounted on said carriage and having a plurality of nozzles through which ink is ejected;

an ink cartridge mounted on the carriage, said ink cartridge comprising;

a housing having at least one wall,

an ink supply port formed on the wall of said housing at an offset position, the ink supply needle being inserted into the ink supply port, and

an engaging recess formed in the wall of said housing adjacent to said ink supply port, said engaging recess receiving the projecting members of the printer,

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wherein the engaging recess and the projecting members of the printer align the ink supply port with the ink supply needle prior to insertion of the ink needle into the ink supply port.

93. (Previously Added) An ink jet printer as in claim 92, wherein the ink supply needle, at least one of the projecting members, and the engaging recess are all dimensioned so that the ink supply needle does not contact the ink cartridge when the ink cartridge is placed on the carriage in an orientation such that the ink supply needle is not received in the ink supply port.

94. (Previously Added) An ink jet printer, comprising:

- a cartridge holder including a projecting member, and a lever having a lifter;
- a print head including a plurality of nozzles through which ink is ejected, the print head being fixed with respect to the cartridge holder;
- an ink cartridge being mounted on the cartridge holder and comprising:
 - a housing having an opening, said housing containing ink therein;
 - a lid covering said opening of said housing;
 - an ink supply port formed on a wall of said housing;
 - an engaging recess formed in the wall of said housing adjacent to said ink supply port, said engaging recess being engageable with the projecting member when the ink cartridge is correctly mounted on the cartridge holder, wherein:
 - said engaging recess is engageable with the lifter, and

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said engaging recess comprising a first section for receiving the lifter and a second section for receiving the projecting member, and said first section and second section being formed continuously.

95. (Previously Added) An ink cartridge for an ink jet printer including a carriage having a plurality of projecting members and an ink supply needle extending therefrom, the ink cartridge being mountable on the carriage and comprising:

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a housing having at least one wall,

an ink supply port formed on the wall of said housing at an offset position, the ink supply needle being insertable into the ink supply port, and

an engaging recess formed in the wall of said housing adjacent to said ink supply port, said engaging recess receiving the projecting members of the printer,

wherein the engaging recess and the projecting members of the printer align the ink supply port with the ink supply needle prior to insertion of the ink needle into the ink supply port.

96. (Previously Added) The ink cartridge of claim 95, wherein the ink supply needle, at least one of the projecting members, and the engaging recess are all dimensioned so that the ink supply needle does not contact the ink cartridge when the ink cartridge is placed on the carriage in an orientation such that the ink supply needle is not received in the ink supply port.

97. (Previously Added) An ink cartridge for an ink jet printer, comprising:

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an ink cartridge main body having an ink chamber communicating with an ink supply port; and

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a lid covering an opening portion of the ink cartridge main body, and having an atmosphere communication port through which the ink chamber is communicateable with atmospheric air,

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wherein a narrow groove, sealed by a film to define a capillary, is formed on a surface of the lid, one end of the narrow groove communicating with the atmosphere communication port, and the other end of the narrow groove communicating with an opening to be open to the atmospheric air, and

wherein a recess for storing a negative pressure under vacuum is formed on a portion of the outer surface of the lid where the narrow groove is not formed.

98. (Previously Added) The ink cartridge of claim 97, wherein a plurality of the recesses for storing the negative pressure under vacuum are formed so as to mutually communicate with each other.

99. (Previously Added) The ink cartridge of claim 97, wherein the recess is partitioned by protruding portions into a plurality of recesses arranged in a grid shape.

100. (Previously Added) The ink cartridge of claim 99, wherein at least one of the protruding portions has a notch by which the recesses located opposite to the same ink chamber mutually communicates with each other.

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101. (Previously Added) The ink cartridge of claim 97, wherein an opening area of the recess is dimensioned so as to prevent the film from closing the recess by the action of atmospheric pressure.

102. (Previously Added) The ink cartridge of claim 97, wherein at least a portion of the film, which is not peeled off from the lid, is located inwardly of an outer edge of the lid, and a protruding portion having a height larger than a thickness of the film is formed on the outer edge of the lid.

103. (Previously Added) The ink cartridge of claim 102, wherein an annular groove is formed adjacent to the protruding portion.

104. (Previously Added) The ink cartridge of claim 97, wherein an annular groove is formed in the vicinity of an outer periphery of the lid, the annular groove communicating through a notch with the recess disposed at an end portion of the ink cartridge.

105. (Previously Added) The ink cartridge of claim 99, wherein the protruding portion is disposed opposite to a partition wall partitioning the ink chamber into two chambers, and the protruding portion has an engagement groove that is disposed in the side of the ink chamber and that is fitted to an upper end of the partition wall.

106. (Previously Added) The ink cartridge of claim 97, wherein a rib is formed on a back surface of the lid opposite to the narrow groove.

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107. (Previously Added) The ink cartridge of claim 97, wherein a rib for pressing a porous member is formed on a back surface of the lid, and the narrow groove is opposite to the rib.

108. (Previously Added) The ink cartridge of claim 97, wherein the narrow groove is defined by two protruding portions spaced from each other.

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109. (Previously Added) The ink cartridge of claim 108, wherein the film is adhered to surfaces of the two protruding portions to define the capillary for atmosphere communication.

110. (Previously Added) The ink cartridge of claim 97, wherein the opening of each of the narrow grooves are enlarged toward an end portion thereof, and the plurality of the openings are arranged spreadingly in a fan shape.

111. (Previously Added) The ink cartridge of claim 97, the film includes first and second films, the first film is removably adhered to cover the narrow groove and the second film is adhered across the first film, to thereby form the capillary.

112. (Previously Added) The ink cartridge of claim 97, wherein the opening and the recess are covered by a film removably adhered to the lid.

113. (Previously Added) The ink cartridge of claim 97, wherein the ink cartridge is packed by a packing member of an air impermeable film under a vacuum condition.